

Review of CV-SALTS Salinity Economics Report

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This highly technical report could use some simplified overview sections describing the major assumptions and concepts. Here are some specific questions that should be clarified in the document.

- 1) Because the populations, employment, income and output numbers are separated into the three basins, shouldn't the economic impacts from salinity also be discussed for each basin?
- 2) Does the report follow the basic advice from the technical committee that "salt can only be evaluated properly within a water budget/salt balance framework"?
- 3) Does the report assume salt loads from all economic sectors without regard to the water source or the discharge of the salt load? I suggest that all salt loads are not the same; only high concentrations of salt will lead to beneficial use impairment.
- 4) Are economic impacts from salinity related to the assumed changes in source concentrations? The report assumes source salinity concentrations that are low (about 250 mg/l) for all users within the basins. Does the report assume that the source salinity will increase to about 350 mg/l over 30 years for all uses in all basins? The causes for these salinity increases are not described and discussed and identified as assumptions. I suggest that salinity impacts from higher concentrations will only occur in a few locations.
- 5) Is it true that Sacramento irrigation lands will not have any salinity economic impacts? Is it true that most of the San Joaquin and Tulare irrigated lands will not have salinity economic impacts? Is it true that salt loads in the Sacramento basin will have no economic impacts because salinity will never be high enough to impair any beneficial use? It was not clearly described that salinity impacts are expected in only some irrigated lands.
- 6) The natural salt loads in the rivers were not identified, so there is no basis for judging the magnitude of the "salt loads" from the economic sectors. Although the Sacramento salt loads sound big, they are only a small fraction of the normal river load.

I am suggesting that a companion report should be prepared that describes the basic water and salt balance for each basin (or sub-basin) within the CV. For example, the Sacramento basin tributary salinities and the groundwater basin salinities (shallow and deeper pumped aquifers) should be identified. The effects of agriculture (irrigation diversions, ET, infiltration, drainage) on groundwater salinity and river salinity should be outlined. The effects of municipal (domestic and commercial) wastewater salinity can then be shown- within the seasonal (monthly) water budget. The important result will be the seasonal salinity concentration (of about 50 mg/l to about 150 mg/l) of the Sacramento River as it flows past Freeport, picking up the last wastewater and irrigation drainage from south Sacramento and Yolo counties. By clarifying the water budget and the effects of the "salt loads" within the basin, we can with confidence suggest that salinity will not present any major constraint to any beneficial uses within the Sacramento Basin. Therefore, half of the Central Valley will never have a salt issue, because of the abundance of water supply.

- 7) Does the economic forecast model suggest that agriculture provides very little of the economic output for basins? For example, Sacramento agriculture and food processing yield only \$3.5 B out of the \$150 B 2005 economic output?
- 8) The salt load tables need to be adjusted, because the source concentration should not be included in the salt load estimates. The basic conversion factor for tons of salt in an acre-foot of water with 1 mg/l of TDS should be identified. The tables would be more readable if just a few significant digits were used (i.e. 2.2 million people, 3.5 billion dollars).
- 9) A little more discussion of the assumed incremental salt concentrations for each economic sector should be given. The estimated domestic salt loads are too high because the landscaping use fraction (about 50%) does not have any incremental salt load.
- 10) The assumed irrigation salt loads are never properly described. These should be identified within the "farm water/salt budget". For example, assume that 80% of the applied water is evaporated. The average drainage salinity would then be 5x the applied source salinity. If all the drainage went into the shallow groundwater, the load and effect on the shallow groundwater concentration can be estimated. If half of the drainage went to the river, the effect on the shallow groundwater would be reduced, and the effects on the river concentration (and river load) could be calculated.
- 11) More information about the assumed increases in applied salinity and shallow groundwater salinity for the crop production modeling is needed.
- 12) Are the modeling results suggesting that the total salinity economic impacts would be about \$2B per year in 2030? Can this be compared with the projected

economic output of \$770B per year? This would suggest that non-regulated salinity increases would have only a 0.25% reduction in the economic output of the CV?

I am suggesting that this lumped CV analysis introduces the economic modeling techniques, but does not emphasize the important assumptions between applied salinity, shallow groundwater salinity, and agricultural production economics. I suggest that we should focus on those conditions within the basins where salinity is high enough to impair beneficial uses. All other "salt loads" are being balanced by drainage and river flows to the ocean. Economic analysis should be guiding our efforts to regulate, control or leave well enough alone.